MARINE REVIEW.

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Growth of the Steel Ship Building Industry.

In view of delay in completing census returns relative to the ship building industry in this country, and especially that part of the work pertaining to progress in steel ship building, the REVIEW has procured some information from leading builders of steel ships that should have an important bearing on anything in the way of shipping legislation that may come up in Congress during the present or the regular session. A short time ago a circular letter was addressed to twenty-five of the leading ship builders on the Atlantic and Pacific coasts and the lakes, asking for approximate figures covering the present value of their plants, and also how much of such values is represented in investments made within the past ten years. No effort was made to include the numerous small concerns throughout the country. Neither was any account taken of the large number of marine engine and boiler works, which are operated independent of any ship yard. Information bearing upon the one item of value of works and increase in the same during ten years was sought from only such concerns as are engaged in building vessels of large tonnage.

Answers were received from all but a few companies, the values of whose plants were readily estimated. The footings show that the twenty-five concerns, to which the letters of inquiry were sent, have works valued at $32,865,000, of which $24,996,000 has been expended in additions and improvements within the past ten years. The works involved in this calculation are: William Cramp and Sons' Ship and Engine Building Company, Philadelphia, Pa.; Atlantic Iron Works, Boston, Mass.; Union Iron Works, San Francisco, Cal.; Bath Iron Works, Bath, Me.; Newport News Shipbuilding and Dry Dock Company, Newport News, Va.; Arthur Sewall & Co., Bath, Me.; Delaware River Iron Ship Building and Engine Works, Chester, Pa.; Pusey & Jones Company, Wilmington, Del.; Neafie & Levy, Philadelphia, Pa; Columbian Iron Works, Baltimore, Md.; J. H. Dialogue, Camden, N. J.; Harlan and Hollingsworth Company, Wilmington, Del.; Harrison Loring, Boston, Mass.; Maryland Steel Company, Sparrow's Point, Md.; Samuel Moore and Sons, Elizabethport, N. J.; Pacific Steel Barge Company, Everett, Wash.; Iowa Iron Works, Dubuque, Ia.; Globe Iron Works Company and Cleveland Ship Building Company, Cleveland, O.; Detroit Dry Dock Company, Detroit, Mich.; Union Dry Dock Company, Buffalo, N. Y.; Craig Ship Building Company, Toledo, O.; F. W. Wheeler & Co., West Bay City, Mich.; Chicago Ship Building Company, Chicago, Ill.; American Steel Barge Company, West Superior, Wis.

As indicated by comment made by Henry W. Cramp, secretary and treasurer of the Cramp company, in answering our letter of inquiry, this matter of value of works and the additions being made to them is only one feature—and not the most important one—of the shipping question. He says:

"We do not share the apparently prevalent apprehension that the present Congress will enact any law calculated to affect seriously the shipbuilding interests of the United States. But if such information may be useful or interesting to you, we would say that the amount of money we have expended in development of shipbuilding and its cognate or contributory industries can not be measured by the cost or value of mere enlargement of our plant. In the broad sense the money that we have paid for labor and material, tending to enlarge the power of organizations and augment the general output capacity of our own and other works, is the real measure of what we have done to promote ship building. From this point of view you may say that we have in the last ten years spent about $20,000,000 in the direction indicated by your inquiry."

Engineers as Officers of American Vessels.

Since ex-Secretary Foster of the treasury department made the surprising ruling, several months ago, in the case of the American steamers Paris and New York, that engineers were not officers of American vessels, the officers of the National Association of Marine Engineers have directed efforts toward securing an amendment to the United States statutes that would remove all doubt regarding the question involved, and the House of Representatives on Thursday last passed a bill to this end, which reads in full as follows:

"Be it enacted, etc., that section 4131 of the revised statutes of the United States be amended so as to read as follows:

"Section 4131.—Vessels registered pursuant to law, and no others, except such as shall be duly qualified, according to law, for carrying on the coasting trade and fisheries, or one of them, shall be deemed vessels of the United States, and entitled to the benefits and privileges appertaining to such vessels; but they shall not enjoy the same longer than they shall continue to be wholly owned by citizens and to be commanded by a citizen of the United States. And officers of vessels of the United States, *including engineers and assistant engineers of all steam vessels*, shall in all cases be citizens of the United States.

"Provided, however, that in cases where on a foreign voyage, or on a voyage from an Atlantic to a Pacific port of the United States, any such vessel is, for any reason, deprived of the services of an officer below the grade of master, his place, or a vacancy caused by the promotion of another officer to such place, may be supplied by a person not a citizen of the United States until the first return of such vessel to any port of the United States; and such vessel shall not be liable to any penalty or penal tax for such employment of an alien officer."

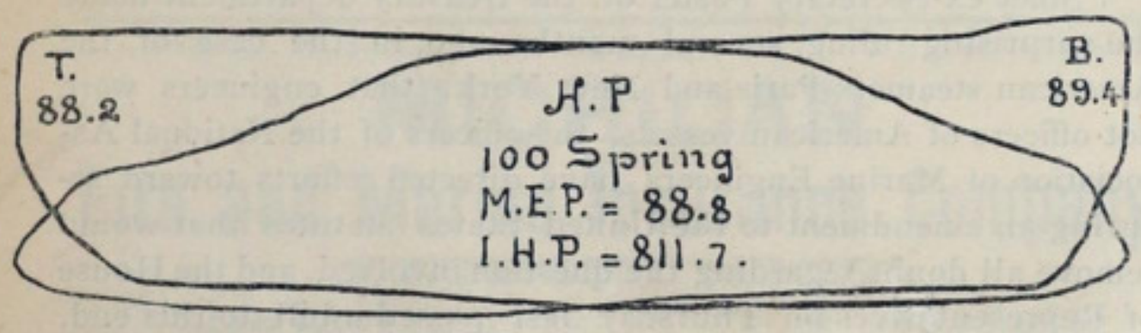
The important part of the foregoing bill changing the present reading of the statutes is that printed in italics, and it simply makes doubly sure the general understanding that engineers are officers according to law, although ex-Secretary Foster ruled to the contrary when English engineers were retained on the steamers Paris and New York. There was no opposition to the passage of this amendment in the House, and there is no indication of any opposition in the Senate. If the Senate should fail to concur in the amendment the road will be clear for any vessel owner to employ alien engineers, but the national representatives of the engineers in the United States are prepared for such a contingency through plans undertaken some time ago to test in the courts the ruling of the ex-secretary under the existing law.

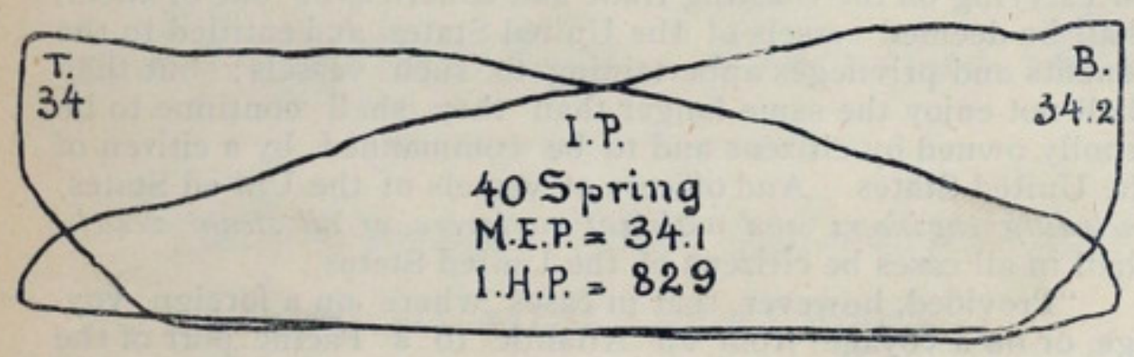
The Two Revenue Cutters are Secured.

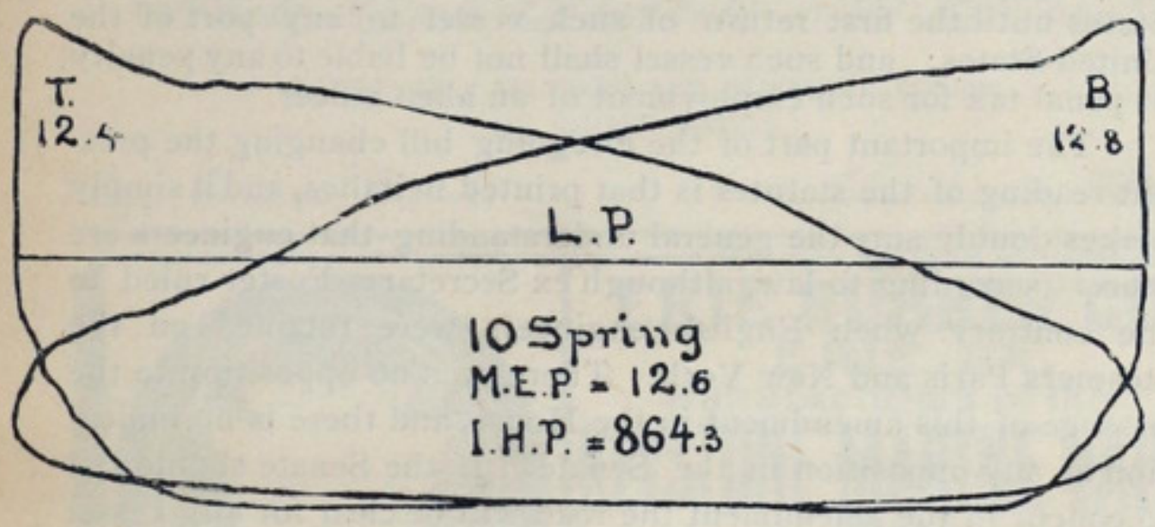
The two first class steam revenue cutters, for which the treasury department has been trying to secure appropriations for some time past, are assured through favorable action in both houses of Congress, and as soon as the bills providing for them are signed by the president, the department will undoubtedly hurry the work of obtaining proposals for construction. One of the boats is for Lake Michigan and the other for the New England coast. They are to cost about $175,000 each. It is very probable that lake builders will put in bids low enough to get these contracts. Pacific coast representatives are still trying to obtain appropriations for two similar boats for that section of the country but the feeling in Congress is against further expenditure of money in this line.

The Centurion Making a Record.

Cards printed herewith are from the engines of the steel steamer Centurion, built by F. W. Wheeler & Co., West Bay City, Mich., for the Hopkins Steamship Company of St. Clair, Mich. The Centurion, which is one of the three Wheeler-built boats that are the largest on the lakes, is also proving to be very fast. Recently she made the run from Buffalo to Duluth, a distance of 997 miles in 67 hours and 50 minutes, which is equal to an average speed of 14.7 miles an hour; and the distance across Lake Huron, 223 miles, was covered in 14 hours and 5 minutes, an average speed of 15.9 miles an hour. Capt. W. C. Brown, of St. Clair, Mich., is in command of this boat and Mr. M. Toner is the chief engineer.







Cards taken Sept, 26, 1893, on Lake Erie, from engines of steamer Centurion, built and engined by F. W. Wheeler & Co., West Bay City, Mich.
Cylinders, 23, 37½ and 63 inches by 44 inches stroke.
Boiler pressure, 170 pounds; first receiver 62; second receiver 10.
Vacuum, 23 inches.
Revolutions, 99.
Total I. H. P., 2,505.

There are some important features in the Centurion's construction to which attention was not directed while she was being built. Her principal dimensions are: Length over all, 378 feet 6 inches; length of keel, 360 feet; breadth, moulded, 45 feet; breadth, extreme, 45 feet 2½ inches; depth, moulded, 26 feet; depth of hold, 13 feet 2½ inches; height between decks, 9 feet 2 inches; height of forecastle, 6 feet 9 inches.

All the material (open hearth steel) used in her construction was tested to stand a tensile strength of 60,000 pounds per square inch, with an elongation of 25 per cent. in eight inches. Her scantlings throughout are of a standard that secured for her the highest class obtainable in the United States Standard Steamship Owners', Builders' and Underwriters' Association. Her plating butts are overlapped, instead of butt-straped, and steel rivets are used throughout. All stringers and longitudinals are treble-riveted throughout, and spar deck stringers are double-riveted. Two 20-inch stringers run her entire length, and her web frames are spaced 16 feet apart, extending to the spar deck. Her deck beams are supported by three tiers of extra heavy I stanchions. She has a double bottom for water ballast extending fore-and-aft, built on the cellular plan, 54 inches deep and having capacity for 1,500 tons of water. She has five large gangway ports on each side, and every modern appliance in the shape of deck winches and steam hoisting gear to insure despatch in handling both package freight and cargoes in bulk. She is fitted with the American Ship Windlass Company's steam windlass and steam capstan and her steam steering engine was built by Williamson Bros. of Philadelphia, Pa., and arranged for both hand and steam. She is steam heated throughout, and lighted with electricity, having a 210-light dynamo, operating under 110 volts, large cargo lights being included in the outfit. The cabins are roomy, well ventilated, and elaborately finished in hardwood, equal to the best passenger steamers of fresh water. She is rigged with two masts and standing gaffs.

The Centurion is propelled by a modern triple expansion engine, with cylinders 23, 37½ and 63 inches by 44 inches stroke, driving a wheel 13 feet 6 inches diameter and 18 feet pitch. The high and intermediate pressure cylinders are fitted with piston valves and the low pressure cylinder has a double-ported slide valve, all operated by Stevenson's link motion, controlled by steam reverse gear. The bed plate is of the box type and cast in one piece. The frame consists of three straight cast iron columns on the starboard side, and three "Y" shaped columns on the port side, all strongly bolted togeter with through bolts. The piston rods are of steel, and the crossheads and connecting rods of wrought iron. Tho crank shaft is of the built-up type, and all brasses are fitted with the best Magnolia metal. All pumps are independent, and all exhaust steam passes through a large feed water heater with brass tubes. Steam is supplied at pressure of 170 pounds per square inch by three cylindrical return tubular boilers 12 feet 6 inches diameter by 12 feet 8 inches long.

The cards were taken on the steamer's maiden trip, when she was drawing 15 feet aft and 2 feet 6 inches forward, the engine working perfectly in every respect. Reports from the officers in charge of the boat regarding her performance are in every way most flattering.

Lake Freight Matters.

Iron ore shipments would have been suspended almost entirely by this time but for the movement from the Missabe range, and it is generally understood that two of the mines making heavy shipments from the new range are forced to do so under agreements regarding their output. The ownership of these properties having fallen into the hands of the Merritt-Rockefeller syndicate, the lessees are forced to live up to their agreements. Grain freights show no signs of special improvement, even for the latest trips, and vessels are taking cargoes of all kinds at rates that afford a very small margin above operating expenses. There is a shortage in both hard and soft coal shipments, and coal freights are accordingly picking up a little and will probably continue to improve until the close of the season.

A Washington despatch says that Col. William Ludlow, of the United States army engineer corps, who was so unjustly treated by the light-house board in the St. Mary's river lighting matter, will be assigned as military attache of the United States embassy at London.

The statement that the first two of the American line ships building at Cramp's would be named Southampton and Queenstown is denied, and St. Louis and St. Paul are the names now assigned to them.

Hydraulic Appliances for the Construction of Boilers.

This is the subject of one of the many interesting papers presented in the marine and naval engineering branch of the engineering congress held in Chicago in connection with the World's Columbian Exposition. The author, Signor G. Migliardi, late engineer officer in the Italian navy, begins by attributing to Mr. Ralph Hart Tweddell of Messrs. Platt and Fielding, England, the credit for the introduction of hydraulic tools in workshops, and then goes on to point out that for modern boiler work, with the thick plates now in use, they are an absolute necessity. He says that an ordinary plant will need about 25 effective horse power, but this depends, of course, on the number and size of the machines and also on the skill and care with which they are used. The water used in the hydraulic machines generally contains a little soap dissolved in it for the purpose of reducing friction and preserving the mains and tools, but in cold countries, where water would freeze, glycerine is used instead of soap. In those places where cold is not severe, about one per cent of glycerine will suffice, but in less favored places it is necessary to use 20 or 30 per cent. The working pressure is generally about 100 atmospheres, or 1500 pounds. The author gives slight details as to the construction of the mains leading to the various tools, and then takes up the accumulators, calling attention to the difference between the simple and the differential accumulator. The former is more useful generally, both as storing the greater amount of water and being less complicated, while the latter has the advantage that great pressures may be obtained without excessive reduction of the sections of the ram. He also calls attention to the various methods of weighting the rams of accumulators, and the automatic appliances for regulating the pumps supplying the water under pressure. Attention is directed to the advantages of hydraulic transmission of power as compared with shafting, or even separate steam motors, inasmuch as they create less friction than the former and less loss of power than the latter due to condensation of steam. The loss of friction in hydraulic apparatus is much less than is ordinarily suppposed, experiments having shown that in a properly packed cylinder of ten centimetres diameter, a loss of effective power was only one per cent, while with a diameter of about a foot it is, approximately, only about one-third of one per cent. Other advantages are: Less space required; the building equipped with a hydraulic plant need not be built so stoutly; there is greater safety for the men, owing to the fact that there can be no explosion; the life of hydraulic machinery is practically indefinite, and there is an almost entire absence of the din which obtains in ordinary boiler shops.

The paper describes the various forms of shears and punches, and then takes up the subject of flangers. Various types of these are described, including one designed by the author for special economy and time, and which possesses many ingenious features. The Tweddel flanger, best known in this country, is also described. One of the special advantages in the Migliardi flanger is its great simplicity and the simplicity of the operating mechanism, only a single lever being employed to work these presses or flangers, and which controls all their operations. This press is very powerful, and can be used to flange the head of a boiler 16 feet in diameter at a single operation, if desired. As showing its capacity, the author states that they have flanged fifty boiler heads about five feet in diameter and one-half inch thick in ten hours. He then takes up the subject of riveting machines, describes the various kinds, giving drawings of some, and gives a lengthy description of the hydraulic part of the usually powerful stationary hydraulic riveters. In course of this description, he states that the number of rivets that can be driven in place by a portable hydraulic machine, although depending on the kind of work and the more or less convenient position, may be taken as from two to three thousand in ten hours. A fair standard, which he has verified by practice, is to consider that the hydraulic machine can drive from eight to ten times as many rivets as a squad of riveters placed under the same conditions.

The most important part of the paper is an elaborate description of his own large hydraulic riveter, of what may be called the semi-stationary type. In this the hydraulic portion for actually driving the rivets and closing the plates is the same as in the big Tweddell machines, the author's improvements consist of the way in which the boiler shell is supported and the fact that the riveter is supported on a fulcrum which permits it to have a slight oscillating motion. He describes in detail how the machine is balanced and how provision is made to maintain the balance, although water is let into the hydraulic rivet driving portion. Instead of having a crane attached to the building for handling the boiler, he has a tower or trestle crane, from which the boiler is hung by chains with plate links, and which are capable of ready adjustment by either adding or removing a link, and also by slight adjustment of the supports of the piles. The crane is made large enough to straddle any marine boiler up to 16 feet in diameter, and runs on a track, the rails of which are parallel to the axis of the shell. The length of the riveter is also in this same direction by means of wire ropes led to the crane and also to the boiler and thence to the small end of hydraulic attachments alongside of the riveter proper. It is possible for a single man to remove the boiler either in the direction of its axis or to rotate it on the axis, and thus to bring any desired rivet hole in the proper position for driving the rivet. An important feature of this riveter is that the length of the frame is horizontal instead of vertical, as in the usual types, so that the rivet is driven vertically instead of horizontally. The personnel for using this machine and riveting up the large boilers consists of two men and a boy, who looks after the rivets. One man works the levers, while the second attends to passing the rivets into the holes and warning the first one as to the amount of adjustment needed. Details are given of all the points by which the desired manipulations are carried out. It may be stated that the lower frame is in a pit in the floor of the shop. The rivet dies are brought into operation at a distance of about two feet above ground. As may be readily imagined, the object of having the riveter supported so as to allow of movement and oscillation is to adjust itself automatically to slight variations in the height of the boiler, and the same thing is claimed by the author for the method of suspension from the tower or trestle crane, in that the boiler is, to some extent, in the position of a pendulum, and there is not such a nice adjustment required of the position of the riveter and the shell in regard to each other as in the usual type.

In addition to such advantages as low cost of installation, little waste of energy and a small operating force, the author claims a wide field of application for his machine. In the ordinary riveter the maximum length of any riveted structure depends on the height of the building or crane for handling it. In this machine such is not the case, as the length is only limited by the length of the building, which may very readily be made very much longer than any riveted structure would ever be. As a matter of fact, the machine is frequently used for riveting smoke pipes and other cylindrical pieces of great length. Its application to other purposes is also important. The machine is very powerful, being capable of exerting a pressure of 150 tons, and by substituting for the riveting dies, dies of different forms, or other attachments, it can be used as a powerful punch, or shears, or for stamping out various shapes. This last feature is desirable, inasmuch as so large a machine is necessarily expensive, and everything should be done to enable it to be kept in use as much as possible.

Inventions of a Marine Nature.

Specially reported from the patent office, Washington, D. C., for the MARINE REVIEW.

507,096—Life boat, by John A. Aniello of New Orleans, La.; filed Jan. 19, 1893; assignor of part interest to Walter L. McConico and Charles E. Rice of the same city. The boat is provided with an inner bottom sloping to stern and ending in a well. Scupper holes at each side of the latter are provided with splash boards and shields.

507,099—Boat with rollers, by Ernest Bazin of Paris; filed Sept. 14, 1892. The boat has circular rollers at sides, these being smooth and propelled by machinery independent of the propellers.

507,135—Hydraulic steering apparatus, by Charles S. Irwin of St. Joseph, Mo.; filed Aug. 12, 1892.

507,320—Screw propeller, by Henry C. Happold of New York; filed May 31, 1893. The boss of the propeller is tapering in form, and the tip or end is supported by a bracket attached to the body of the vessel.

507,439—Portable boat, by Charles W. King of Kalamazoo, Mich.; filed Feb. 11, 1893. The sheathing and lining are flexible. The frame is composed of folding gunwale and keel, sectional ribs attached to keel by hooks, and sections joined by tubular extensions.

507,459—Propeller, by Lorenzo D. B. Shaw of Coney Island, N. Y.; filed Nov. 18, 1892. Right and left screws rotate in opposite directions in the amidship chamber, to and from which there is water access from the ends of the boat.

507,502—Screw propeller, by John D. Muller of New York city; filed Dec. 2, 1892. The patent is essentially for a sectional hub.

Copies of specifications accompanying these patents can be had at 15 cents each upon application to the MARINE REVIEW, 516 Perry-Payne building, Cleveland, O.

Tribute to the Late John H. Smith.

The following resolutions were adopted at a meeting in New York of the managing committee of the United States Standard Steamship Owners', Builders' and Underwriters' Association:

WHEREAS, This association learns with regret of the death of Mr. John H. Smith, late superintendent of the Globe Iron Works Company of Cleveland, Ohio, and a member of this association;

Resolved, That we deeply deplore the loss of a most worthy and highly respected associate, from whose great practical knowledge of iron ship building, wide experience and generous co-operation this association has derived great benefit.

Resolved, That these resolutions be entered on the minutes of the association and a copy sent to the family of our deceased member and friend.

ANNOUNCEMENT OF THE NICKEL PLATE ROAD.—Commencing Sunday, Nov. 5, train No. 3, leaving Buffalo at 11:25 p. m., reaching Cleveland at 6:10 a. m., and train No, 4, leaving Cleveland at 9:30 p. m., reaching Buffalo at 3:40 a. m., will be discontinued between Cleveland and Buffalo. These trains will run as heretofore between Cleveland and Chicago. The splendid double daily train service in each direction between Buffalo and Chicago will not be disturbed by this change. Palace dining cars and superb sleeping cars will be run as before between Chicago, Buffalo, New York and Boston, in connection with the West Shore and Fitchburg railroads, but the through service between New York and Chicago via the Lehigh Valley route will be discontinued.

Boilers in Vessels of the U. S. Navy.

In his annual report now in the hands of the printer, Engineer-in-Chief Melville of the navy expresses great satisfaction with the type of boiler used in the new ships. He says:

"The type adopted by the bureau is one which long experience had shown to be efficient and capable of withstanding hard usage, and it is a source of great satisfaction to know that in the trials of our new ships the boilers have stood the strain admirably, and that in service they have proved highly satisfactory. To such an extent had the former design been carried in England, with attendant leakage and unreliability of the boilers, that it was deemed necessary to appoint a committee of engineers to consider existing types and designs of propelling machinery and boilers, and to make suggestions for their improvement. The report of this committee, recently published, recommends a type of boiler almost identical with that which this bureau has been designing. The committee likewise recommends certain apparatus connected with the feeding and the circulation of water in the boilers which has always been required in our machinery specifications. I deem this statement of the trials of our foreign brethren justified in view of the statements which were so loudly expressed at one time that our machinery was too heavy, that we were putting 30 per cent. more weight in our boilers than were the English, and similar statements calculated to discredit the work of this bureau. In the light of the sad experience which that type of boiler has had it looks as if we had put the weight where it was most needed, for we have not been compelled to resort to any makeshifts, however ingenious they may be, to carry our ships through their trials.

"The trial with the Monterey has demonstrated the ease and satisfaction of working coil boilers 'in battery' and in connection with boilers of ordinary type. The one point remaining to be settled before coil boilers are adopted for almost exclusive use is durability. This will be determined by actual experience with those in the Monterey. If they should prove satisfactory coil boilers will be used for almost the entire boiler system of our vessels, with great saving in weight, thus permitting a greater coal supply in cruisers, heavier armor, more coal or heavier guns in battle ships."

Mr. Melville urgently renews his recommendations of last year for an increase in the personnel of the engineer corps; that all assistant engineers be made ward room officers; that engineers be given positive instead of relative rank; that the condition of the enlisted men of the engineer division be improved by better pay, quarters, etc.; that an assistant chief of the bureau be appointed.

Features of Strength in one of the C. & O. Boats.

Contracts for three of the fleet of six steel freight steamers that are to make up the Chesapeake & Ohio line between Liverpool and Newport News, W. Va., were let with Furness, Withey & Co., Limited, of West Hartlepool, England. Messrs. Alex. Stephen & Sons of Linthouse, Glasgow, who also had contracts for three of these steamers, are about to deliver to the owners the last boat under their contracts, but the West Hartlepool firm was delayed in beginning construction and launched the first of the three steamers which they are building only a few days ago. The boat is named Greenbrier, and the following regarding her construction from an English exchange will prove interesting:

"The vessel is built on the web-frame system, with the builders' patent intercostal arrangement. The whole of the main framing is of strong sectional material, so that the top sides are as strong as any other portion. This sectional framing is efficiently backed up, more especially at the upper deck, by extra strong plating; all of the sheerstrake plates, stringer plates, etc., are increased in width and thickness; and so that none of the butts of shell plating should come near any gangways, ports, or other openings, a large number of very long shell plates have been worked into the vessel. In her construction the desire has been to gain strength by dispensing with as many riveted joints as possible by the use of sectional material, long plates and extensive cold flanging. The main and foreholds are divided by iron water-tight bulkheads, efficiently stiffened by iron longitudinal grain divisions. She has cellular double-bottom all fore-and-aft for water ballast, and the afterpeak is also available for a ballast tank. She is fitted with six large steam winches, double-derricks, multitubular donkey boiler and patent stockless anchors housing into hawse-pipes. The steam steering gear is fitted aft, controlled from amidships; there is also a stand-by gear aft. The vessel will be fitted with triple expansion engines by Messrs. T. Richardson & Sons, and it is anticipated that a sea speed of 12 knots will be easily obtained."

One Head for Shipping.

Not until all the government bureaus having to do with our maratime commerce are merged into one department and under one chief will there be good rules and regulations for the execution of the various laws relating to shipping. As it is now one bureau entrenches on the work of another, or else fails to carry out its own properly. And as in the case of that peculiar bureau known as the steamboat inspection service it exceeds its authority and issues regulations of doubtful good for sailing vessels, leading, of course, to trouble, misunderstanding and expense. Too much legislation is worse than too little, but in the case of shipping, there needs to be a radical reform entirely. There is quite an amount of new legislation proposed in this interest, much of it is of the most important kind, and so greatly is it needed that many important measures will doubtless be carried through at the next regular session of Congress. While it can not be said that any of these new laws will become entirely inoperative, yet the business of executing them will either be distributed among the bureaus now in existance, or new ones will be created for that purpose, thus leading to more work and confusion in a department already overburdened. In view, therefore, of what legislation is desired for shipping, it would be the part of wisdom to clear the field a little bit and prepare a department that shall have entire charge of all government work connected with shipping. It is not so much a question of existing laws as it is of those important ones yet to come. Under one chief officer, with only this class of work to absorb his attention, business could be conducted in a manner to meet the government requirements and subserve the public interests. Several bureaus could be done away with entirely and the whole business simplified and such an anomaly as the steamboat inspection service transferred into a sensible shape and confined to its legitimate duties. Before all else, therefore, place all shipping matters under one management, with each service confined strictly to its own work and all reporting to the one responsible and active head.—Maritime Register, New York.

Navigable Inland Waterways of the World.

A trade journal of Germany publishes the following comparative list of the lengths in nautical miles of the navigable rivers and canals of the principal countries of the world:

	Rivers.	Canals.	Total.
Germany	3,152	264	3,416
Brazil	4,442	—	4,442
Russia	4,188	175	4,363
United States	3,370*	666	4,036
France	1,080	630	1,710
China	740	1,054	1,794
Austro-Hungary	585	83	668
Canada	564	107	671
India	520	448	968
Italy	381	64	445
Great Britain and Ireland	357	625	982
Spain	163	54	217
Belgium	142	107	249
Portugal	94	—	94
Sweden and Norway	92	20	112
Holland	68	186	254

*This table is certainly incorrect as regards the United States. The last census gives the number of miles of navigable rivers in this country as 2,300.

British charts of Lake Superior cover the entire north shore. We have them for sale at $1.

Around the Lakes.

Capt. Henry W. Jackman, who died at Toronto a few days ago in his sixty-fourth year, had followed sailing for nearly fifty years.

Nelson Craite, surfman No. 1 of the life-saving station at Two Rivers, Wis., has been appointed keeper of the new station at Kewaunee.

Shipments of lumber by lake last week from Chequamegon bay, head of Lake Superior, amounted to about 40,000,000 feet, valued at about $350,000.

Shipments of anthracite coal out of Buffalo have been falling off during several weeks past and on Nov. 1 they were 154,000 tons behind shipments on the same date last year.

The whalebacks Pathfinder and Sagamore took out of West Superior on their last trip a total of 199,000 bushels of wheat, the steamer taking 98,000 and the barge 101,000. The steamer was loaded in one hour and fifty-three minutes.

Although it was announced a few days ago that the Seymour line, operating on Lake Michigan, had placed a contract for a wooden passenger steamer similar to the Graham & Morton line s eamer Chicora, it is since understood that the steamboat company has negotiations pending for a steel boat, and that the contract will probably go to the Chicago Ship Building Company.

According to estimates made in the office of David Vance & Co. of Milwaukee, the total loss on hulls and cargoes in the great gale of Oct. 14 and in the subsequent northwester of Oct. 24 aggregates $395,000, of which sum $225,000 is credited to hulls and $170,000 to cargoes. Partial losses are not included in the estimates, and neither were the smaller class of coarse freighters totally wrecked included.

A despatch from Port Huron saying that A. Botsford of that place will build a steamer to take the place of the lost Dean Richmond is probably without foundation. Mr. Botsford may apply insurance money received from the loss of the Dean Richmond to the construction of a vessel of some kind, but it is not probable that the new boat will take the place of the lost package freight steamer, which was leased by the Lake Erie company when she foundered.

In Detroit last week two new buckets were put upon the wheel of the big steel steamer Curry without docking her. As the Curry's engines are amidships, little difficulty was encountered in raising her stern high enough out of the water to admit of the buckets being attached by men working on a float in the water. Water was, of course pumped out of the ship's after compartments and into the forward compartments.

A single shipment of eleven Scotch boilers of 14 feet diameter is a big record for a boiler works. The Lake Erie Boiler Works of Buffalo had such a task on hand last week. The boilers were for the Delaware River Iron Ship Building and Engine Works of Chester, Pa., and the shipment was made by way of the Erie canal out of Buffalo. One of the boilers was dropped in getting it aboard a canal boat and it went to the bottom taking the boat with it.

About the 15th inst. a third-order light, showing alternately red and white flashes at intervals of ten seconds will be exhibited from the new structure near the southeast extremity of the outer breakwater, Chicago. Fog signal stations have also been established at the same point and during thick weather a 10-inch whistle will sound blasts of five seconds duration separated by silent intervals of twenty-five seconds. On the same date the third-order fixed white light at Chicago river light station on the inner pier, north side of the entrance to the river, will be discontinued.

Capt. James Davidson of West Bay City, Mich., is figuring with the Michigan Log Towing association to provide steam vessels for the business of towing logs from Canadian ports across Lake Huron to Saginaw river. It is said he will build two large tugs that can engage in this work during the summer and be applied to other service during the spring and fall. Another scheme under consideration is that of applying one of the big wooden steamers of the Davidson Transportation Company to the log towing business, first loading her with about 2,500 tons of coal, that can be used for fuel as it is needed, thus avoiding delay in delivering the logs from the Canadian shore to harbor tugs in the Saginaw district. The steamer could, of course, be used in general cargo business before and after the log towing season.

Sandusky's Coal Shipping Facilities.

Stray items from time to time floating through the marine colums of the press have (unintentionally perhaps) been detrimental to the interests of Sandusky harbor and especially the interests of shippers of coal from that port. It may be well, then, to again note that the sand bar near No. 6 spar buoy has been dredged off and there is now 17 feet of water over over this bar. The steamer Sitka loaded at the new "Short Line" docks at Sandusky on the 24th inst. to 14 feet 6 inches forward and 15 feet aft, and got out without any trouble. The steamer Ionia loaded at the same company's dock on 26th to 14 feet 4 inches and 14 feet 11 inches. The "Short Line" has the only coal docks on Lake Erie where more than one of the large modern derricks equipped with Ludlow bottom-dump five-ton buckets can be put to work on a vessel. This company has three of the large machines of the Excelsior Iron Works pattern so arranged that one, two, or all three can work on a vessel at the same time.

Sailors' Fare.

If the British parliament passes the merchant shipping (provision) bill, now being pushed forward against opposition from ship owners, the sailor will be fed according to the following allowances:

Daily provisions per man—1 pound cooked meat (salt beef, pork or fresh beef), exclusive of bone, 1 pound potatoes (or substitute from time to time agreed on), 1 pound bread, ½ pound flour, ¼ ounce tea, 1 ounce coffee and 2 ounces cocoa on alternate days, 3 ounces sugar, 1 gallon of water. Weekly provisions per man—2 ounces table salt, ½ ounce ground black pepper, 1 ounce mustard, 2 ounces currie powder, ½ ounce pudding spices, ½ pint vinegar, ½ pound peas or beans, 1 pound onions, ½ pound rice, ½ pound oatmeal, 1 pouud currants or raisins, ½ pint bottle of pickles, ½ pound tin condensed milk, 14 ounces butter, 1 pound marmalade or jam. Additional provisions per man—1 pound salt or fresh fish twice a week; fresh soup, with vegetables, whenever practicable.

Iron Mining Matters.

Shipments of iron ore from Two Harbors up to and including Wednesday, Oct. 25, aggregated 833,755 gross tons and were divided as follows: Chandler, 404,414 tons; Minnesota, 344,975; Zenith, 12,998; Cincinnati, 9,939; Canton, 24,412; Franklin, 34,833; Hale, 2,176. Shipments of Gogebic range mines through Ashland up to and including Saturday, Oct. 21, foot up 1,059,384 tons, divided among the different mines as follows: Ashland, 35,823 tons; Aurora, 161,415; Colby No. 2, 49,739; Tilden, 131,563; Germania, 4,975; Iron Belt, 19,353; Montreal, south vein, 2,606; Montreal, north vein, 28,803; Eureka, A, 1,949; Brotherton, 14,643; Comet, 8,385; Eureka, 26,028; Careys, 32,514; Newport, 104,584; Norrie, 228,476; East Norrie, 78,135; Palms, 2,657; Pabst, 91,891; Jack Pot, 1,651; Davis, 13,282; Sunday Lake, 20,903.

At a meeting in Ishpeming a few days ago of managers of the Lake Superior, Lake Angeline and Cleveland-Cliffs mines, three of the oldest and largest properties in Michigan, it was decided to reduce wages to a basis of $1 50 for miners working on contract and $1 for surfmen. This establishes a lower range of wages than has ruled in the Lake Superior region for many years.

Approximate shipments from Missabe mines to Nov. 1, secured from Cleveland sales agents, are: Cincinnati, 32,000 tons; Canton, 24,500; Franklin, 34,800; Hale, 2,200; Duluth Ore Company, 38,000; Biwabik, 115,000; Minnewas, 12,000; Missabe Mountain, 100,000; Mountain Iron, 60,000; Commodore, 75,000.

From the returns compiled by Lloyd's Register of Shipping it appears that, excluding warships, there were 326 vessels of 616,560 tons gross under construction in the United Kingdom at the close of the quarter ending Sept. 30. Of these vessels, 252 measuring 533,201 tons gross, were steam, and seventy-four measuring 83,359 tons gross were sail. The steel vessels numbered 269, iron twenty-four and wood and composite thirty-five. The present figures are less than those of a year ago by about 62,000 tons and less than those of the last quarter by about 12,000 tons.

MARINE REVIEW.

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 516 Perry-Payne building, Cleveland, O.
Chicago office, (branch), No. 706 Phoenix building.

SUBSCRIPTION—$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department contain the names of 3,657 vessels, of1,183,582.55 gross tons register in the lake trade. The lakes have more steam vessels of 1,000 to 2,500 tons than the combined ownership of this class of vessels in all other sections of the country. The number of steam vessels of 1,000 to 2,500 tons on the lakes on June 30, 1892, was 321 and their aggregate gross tonnage 534,490.27; in all other parts of the country the number of this class of vessels was,on the same date, 217 and their gross tonnage 321,784.6. The classification of the entire lake fleet is as follows:

Class.	Number.	Gross. Tonnage.
Steam vessels	1,631	763,063.32
Sailing vessels	1,226	319,617.61
Canal boats	731	75,580 50
Barges	69	25,321.12
Total	3,657	1,183,582.55

Tonnage built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Net Tonnage.
1888	222	101,102.87
1889	225	107,080.30
1890	218	108,515.00
1891	204	111,856.45
1892	169	45,168.98
Total	1,038	473,723.60

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

	St. Mary's Falls Canal.			Suez Canal.		
	1892.	1891.	1890.	1892.	1891.	1890.
No. vessel passages	12,580	10,191	10,557	3,559	4,207	3,389
Ton'ge, net regist'd	10,647,203	8,400,685	8,454,435	7,712,028	8,698,777	6,890,014
Days of navigation..	223	225	228	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

THERE is little of special interest to vessel owners in the long extracts from the annual report of Gen. Casey, chief of the army engineer corps, now being sent out from Washington. Two more seasons of navigation will have passed before the new St. Mary's Falls canal lock, the Hay lake channel and the 20-foot channel throughout the connecting waters of the lakes are completed, Nov. 30, 1895. As the money for these big works is assured almost to an absolute certainty, through the continuous contract system decided upon in previous congresses, there is little if any doubt of their completion within the time allowed for profitable expenditure of the vast sums of money involved. All other matters of interest on the lakes which Gen. Casey's report contains, deal with local river and harbor improvements, and that which is new in them pertains to the estimates of district engineers on work to be carried on during the fiscal year ending June 30, 1895. These estimates were made in the reports of the district engineers submitted to the war department in July last and which were withheld from publication by Gen. Casey. As there are serious doubts of the passage of a river and harbor bill during the coming regular session of Congress, the usual interest is not shown in these estimates.

A SUMMARY of reports on the first page of this issue from ship builders throughout the country shows that in twenty-five leading concerns devoted to the construction of steel ships about $24,000,000 has been expended within a few years in improvements and additions to plants. This item, which is inferior to the vast sums of money paid out for labor, should receive serious consideration from members of Congress who are advocating free ship legislation. It is agreeable to note, however, that Representative Fithian, the leader of the free ship contigent in Washington, is meeting with strong opposition in trying to bring up this question in the House. In view of the progress being made in the ship building industry, it is difficult to understand how the representatives of coast or lake districts, be they Democrats or Republicans, can encourage a change in the present shipping laws admitting of further competition of any kind from foreign built ships.

FROM the Washington office of the hydrographic service vessel masters are informed as to the depths that can be carried into ports in different parts of the coast. If the Chicago officers of this service are desirous of rendering practical and valuable assistance to owners and masters of vessels on the lakes they can do so by taking up similar work here. Monthly bulletins giving the depth of water in all lake ports would be looked to with considerable interest throughout the season of navigation. Such information regarding ports on Lake Michigan, where the depth of water in harbor entrance is often affected through sand bars forming under certain conditions of wind, would be especially valuable. Then, too, there are ports on all of the upper lakes to which a few cargoes of coal are shipped at odd times during the season, when reliable information regarding the draft to which the vessel might load with safety would be greatly appreciated.

IT is hinted that the Frye bill, the famous measure through which it was sought in the last Congress to make radical changes in the rules of the steamboat inspection service and raise the standard of efficiency among engineers in the merchant marine, will be brought up again this winter. There is demand for reform in the steamboat inspection service, but it would seem that the storm of disapproval which the Frye measure met with from shipping interests, on account of the radical and sweeping changes which it proposed for the rules, without proper provisions for a change in the service administering them, should be enough to convince the supporters of the measure that they can never pass it in its original form.

IT would be a waste of time and space to go into detailed contradictions of the claims of the canal company, whose promoters have of late been filling some of the newspapers in lake cities with plans for a ship canal to run from Lake St. Clair through Canadian territory to Point au Pelee, Lake Erie. But unsuspecting people who are liable to invest their money in such schemes should be warned against them. The perpetual motion and flying machine cranks are, to use a common phrase, "not in it" with some of the canal builders who have come to the surface lately.

Anthracite Coal Shipments.

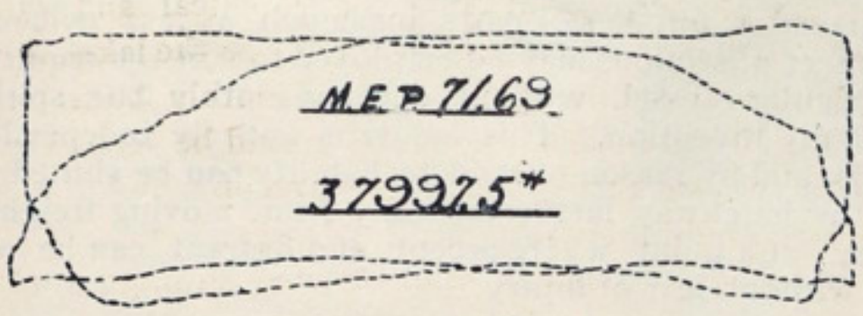
As shown by the table printed below, lake shipments of anthracite coal out of Buffalo during the month of October just passed were 187,058 tons less than during October of 1892. On Oct. 1 of this year the shipments were in excess of a year ago, but the shortage of the past month has resulted in a shortage for the season to Nov. 1 of 154,729 tons. During November and December of last year the shipments aggregated 507,898 tons, so that unless there is a very active movement of anthracite from this time to the close of navigation, the shortage will be much greater than was expected:

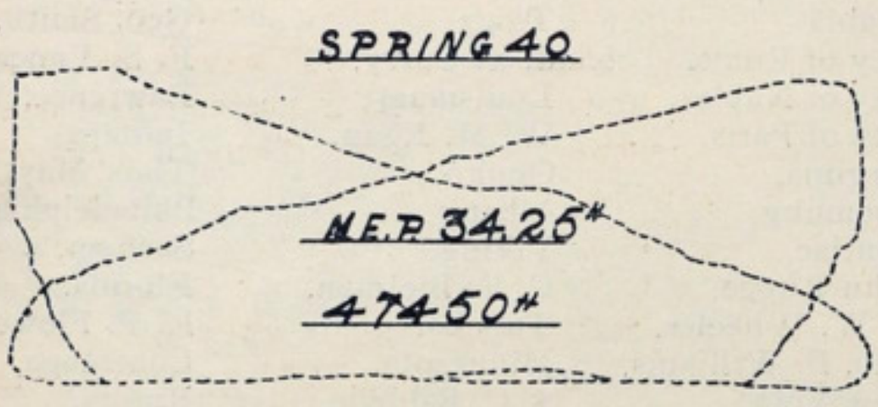
	1893.	1892.
October	359,465	546,523
September	390,168	377,562
August	252,945	247,562
July	254,070	412,814
June	391,580	374,069
May	363,435	273,463
April	178,040	112,439
Totals	2,189,703	2,344,432

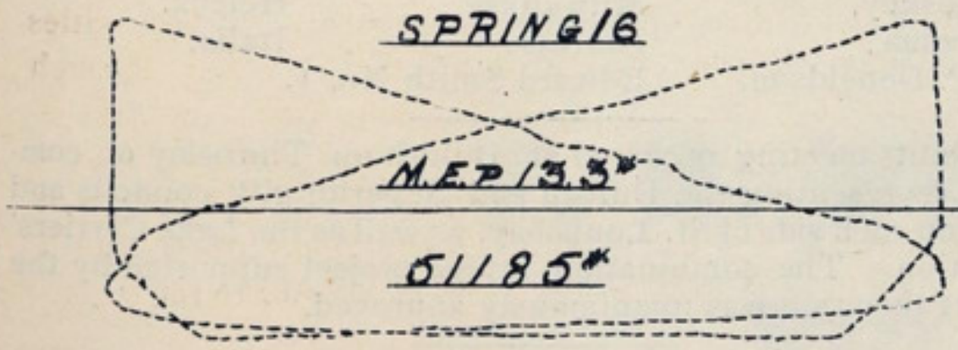
A New York firm is constructing an electric launch for the Grand Duke Alexis of Russia.

The Powerful Whaleback Columbus.

The whaleback passenger steamer Christopher Columbus, which has just closed a successful season of excursion business in connection with the World's Columbian Exposition, having carried more than 1,750,000 passengers in about six months, is in many respects a wonderful boat. As shown by the accompanying cards, the Columbus has developed more power than has ever been shown by a lake vessel.







Cards taken Oct. 5, 1893, from engines of world's fair whaleback passenger steamer Christopher Columbus.

Engines constructed by S. F. Hodge & Co., Detroit, Mich.

Cylinders, 24, 42 and 70 inches by 42 inches stroke.

Indicated horse power—H. P. 806.3; Int. 1,006.5; L. P. 1,087.2; total 2,900.

Revolutions, 100.

Steam, 170 pounds.

Vacuum, 24 inches.

When the managers of the Columbus decided to run her occasionally from Chicago to Milwaukee, opportunity was offered for a test of speed, and on several of these trips, notably in meetings with the palatial twin-screw Goodrich line passenger steamer Virginia, some very fast time was shown. On one occasion the Columbus covered the distance of eighty-four miles in four hours and six minutes, or at the rate of very nearly 20½ miles an hour. The cards here reproduced show 2,900 indicated horse power with engines turning 100 revolutions. On another trip the steamer started out with only two buckets on her wheel and at 117 revolutions an indicated horse power of about 3,350 was shown.

Although the legislative details are not as yet completed in Congress, there is no question of the transfer of the model battleship Illinois, which has attracted so much attention at the World's fair, from the navy department to the state of Illinois for the use of the naval militia of the state. A measure providing for the transfer has passed both houses of Congress.

A "Tracktion" Engine.

For several years there has been employed at the ship yard of the Globe Iron Works Company two traction engines for hauling plates and other material from the bending rolls to the stocks and from the stock sheds to the punches or shears. While these engines may not be as efficient as the cantilever cranes employed at some ship yards, they are the most economical ever constructed, the fuel for each per day costing but about 25 cents, and it is fed by a mechanical stoker that dispenses with the services of a fireman. In fact, the engineer's work is so simple that a boy performs it. Notwithstanding the little care given to the engines, they have never been in the shop one day, and so far as can be determined the flues are in good condition; but the boiler covering has been worn off in some places, disclosing patches of the shell. The boiler feeder is automatic, re-starting, and has a low water alarm attached, which also sounds when the fuel runs low. Self-oiling joints are features of these engines, and not a cent has been spent for oil since they were started. There are, in fact, many features about the engine that ought to be patented, but patterns have been lost, and the extensive ship and engine building business of the company prevents them from manufacturing and placing the engine on the market. The governer is quite unique. Instead of the balls coming close together when the engine has a heavy load, they incline downward and point backward. In such cases an eccentric has been slipped but it has always re-adjusted itself. A more compact or automatic engine has probably never been constructed. It is about 4 feet high, 6 feet long and 2 feet wide. It is high pressure, the cylinder being about 8 by 10 inches. The fly-wheel is attached to the after part, and although it does not run very true it serves its purpose admirably. This defect prevents its being belted to the punches and shears, so that an ordinary engine provides power for that class of machinery. That these engines have been an important feature in the construction of some fifty steel ships during the past six years, the company is free to admit and they would not part with them for any considerable sum. Below is presented an illustration of one of the engines.

For further particulars and details of the mechanical motions apply to Robt. Hay, Globe Iron Works Company, Cleveland, O.

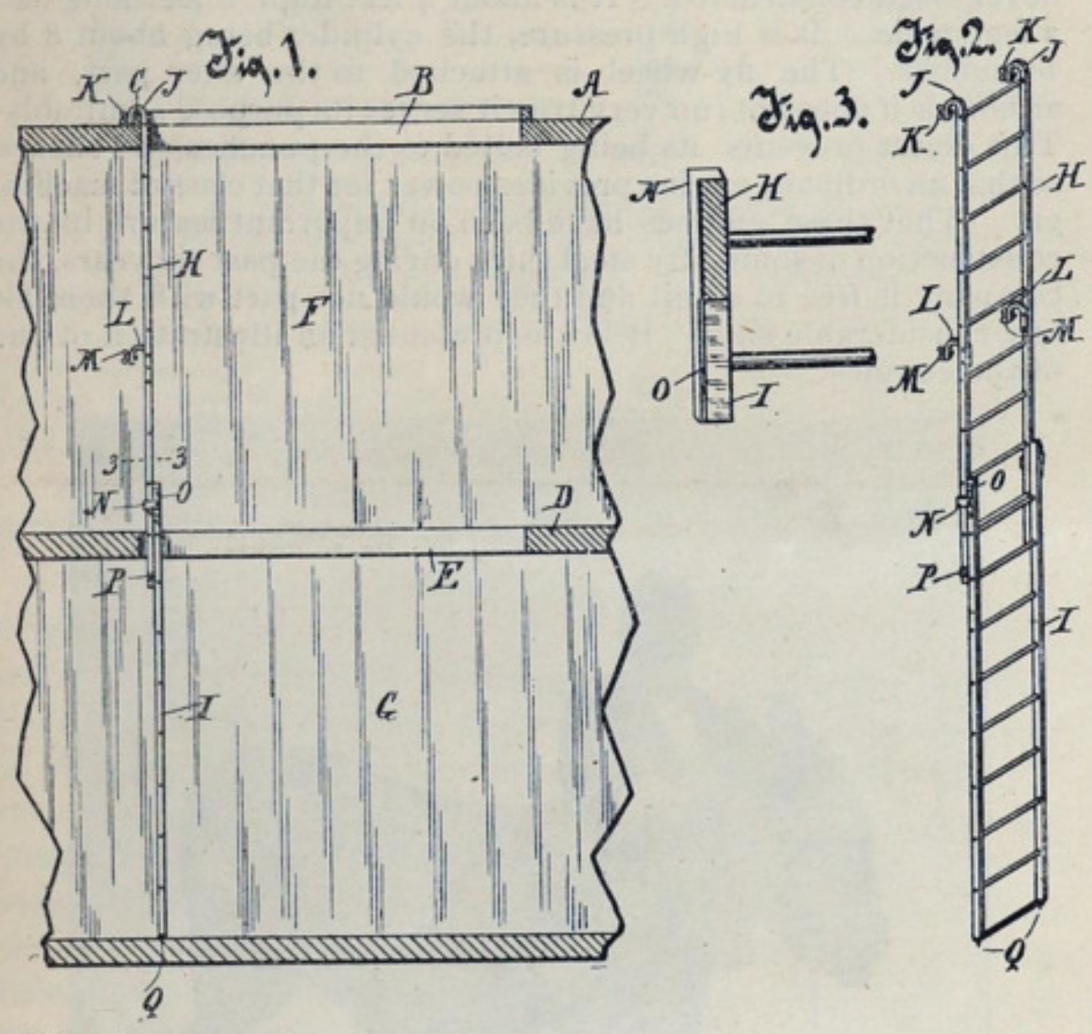
An interesting race of steam launches took place on the Ohio river at Pittsburg on the 14th inst. Numerous entries were made, but there were only eight starters on account of the cyclone which was blowing on that day and which prevented the smaller launches from starting. The race was over a measured course of six miles and the winner was the Gwendoline, belonging to Messrs. George E. and Charles A. Painter of the Pittsburgh Iron Works. Notwithstanding strong wind, the Gwendoline covered the course in 18 minutes and 35 seconds. She has the reputation of being the fastest boat, regardless of size, on the Ohio river. Her success is due to a Roberts boiler, which carries 250 pounds of steam, and which has been in service several years without repairs, although using the muddy Ohio river water.

British charts of Lake Superior cover the entire north shore. $1.

A Patent Hatchway Ladder.

James J. Nagle of Milwaukee, Wis., has secured letters patent (No. 566,063) on a hatchway ladder, the object of which is to prevent accidents to employes ascending the hatchways during the loading or unloading of the ship. The device is thus described by the inventor:

"Fig. 1 is a sectional view taken through the hold of a vessel showing my improved ladder applied thereto; Fig. 2 is a detail perspective view of the ladder, and Fig. 3 is an enlarged horizontal section of the line 3 3 of Fig. 1. The letter A indicates the deck of a vessel, provided with the usual hatchway B, around which is arranged the raised rim C, comprising the usual coamings and head-ledges. An intermediate deck D, also provided with a hatchway E, divides the hold into upper and lower compartments, F and G respectively. The ladder is shown as consisting of two sections, the upper section H being adapted to be secured rigidly, and the lower section adapted to have a sliding motion thereon. The side bars of the upper section are formed or provided, at their upper ends, with hooks J J, which are adapted to fit over the raised rim of the upper hatchway, either over the coamings or head ledges as desired, and secured thereto removably by means of thumb screws K K. Hooks L L are also secured about medially to the inner side faces of the side bars of the upper section, said hooks likewise adapted to receive thumb screws M M for securing them in place when adjusted to the raised rim of the upper hatchway. Each side bar



of the lower section I has secured to its outer face an angle iron N embracing the side face and the rear edge of the contiguous side bar of the upper section, whereby the two ladders are held together, and the lower permitted to have a sliding movement upon the upper. Each angle iron is also provided with a securing flange O. At or near the lower extremity of each side bar of the upper section is secured a stop P, which when said section is secured to the raised rim of the upper hatchway by means of the medial hooks L L, prevents the lower section from becoming detached from the upper when the cargo is sufficiently unloaded to permit the lower section of the ladder to be extended its full length. The ends of the side pieces of the lower section are provided with projections Q Q, to prevent slipping, and of such form as to provide against injury to freight contained in bags, or within other destructible coverings.

"In unloading from the hold, the movable section of the ladder as the cargo decreases in height, automatically lowers until the freight is entirely removed, when it becomes extended its full length, as shown in Fig. 1. In loading the cargo, as the height of the goods gradually increases, the lower section of the ladder is raised to make room therefor, as necessity requires. When the freight is piled up to such a height as to extend through the central hatchway, and rest on the central deck, the upper section of the ladder is suspended by the central hooks L L. When suspended in this way, its upper end projects above the upper deck, while the lower end extends about half way down into the hold, and the lower end of the sliding section rests upon the piled up freight. As the goods are removed, said lower section lowers with the lowering of the freight, always resting upon and being supported by said freight. When it has lowered sufficiently to allow the angle irons to contact with the stops, the upper section can then be suspended from the upper hooks. Ship hands may descend and ascend the ladder with comparative safety, as there is very little danger of their being struck by heavy pieces of freight in loading and unloading, when the ladder is disposed and arranged in accordance with my invention. While I have shown and described the ladder as consisting of two sections, I do not wish to be understood as limiting myself to that particular number of parts, inasmuch as it is evident that any number of sections may be employed to suit the requirement of a particular vessel, without departing from the spirit and scope of my invention. This ladder is entirely independent of the skids, and by reason of its detachability can be shifted to any side of the hatchway fartherest away from moving freight, and therefore, at a point where ascent and descent can be accomplished without fear of injury.

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We have one photograph of each steamer named below and will send them to any address for 75 cents each, or $1 for two to the same address. The size is 9 by 7 inches, mounted on cards of 11 by 14 inches. They are well worth the money. Address the MARINE REVIEW, 516 Perry-Payne Building, Cleveland, O:

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Gogebic,	Merrimac,	Rosedale,
Petoskey,	Milwaukee,	Helena.
Tacoma,	Panther,	Italia,
J. P. Donaldson,	Edward Smith No. 1.	

A joint meeting occurred at Duluth on Thursday of committees representing the Duluth and Superior city councils and citizens on each side of St. Louis bay, as well as the Lake Carriers' Association. The combination bridge project supported by the latter organization was unanimously approved.

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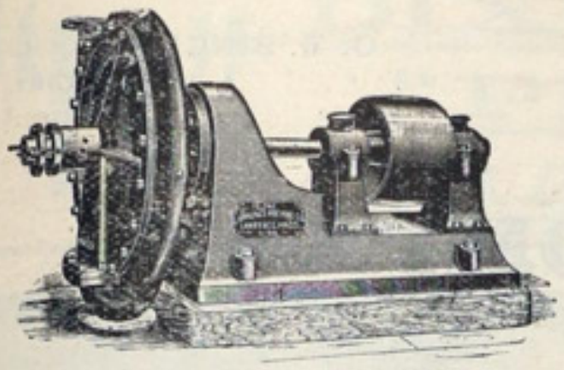

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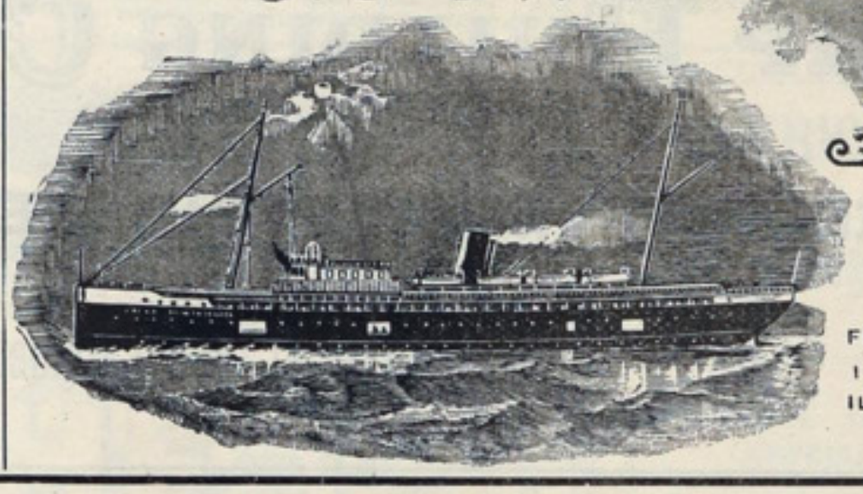

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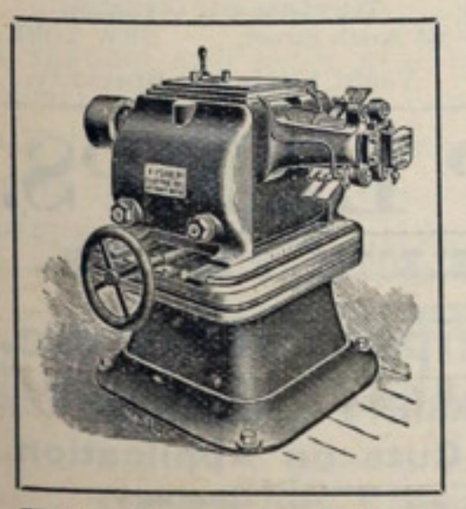

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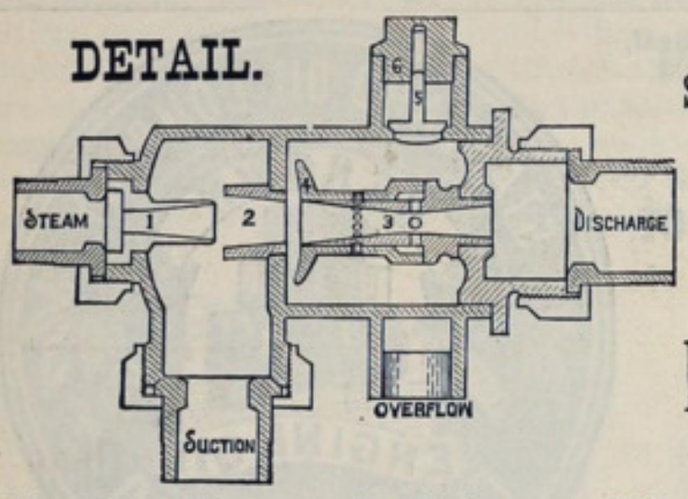

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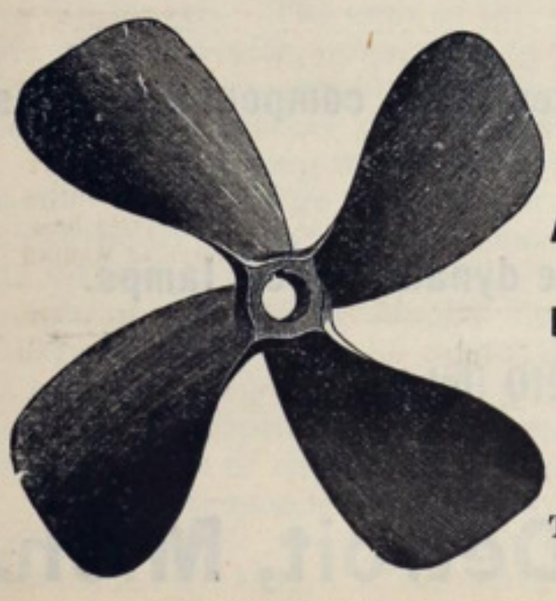

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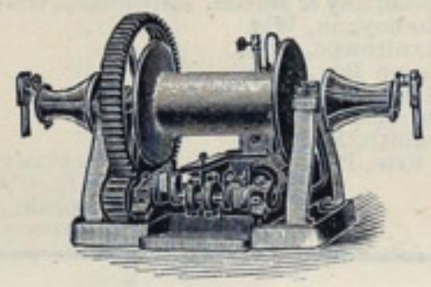

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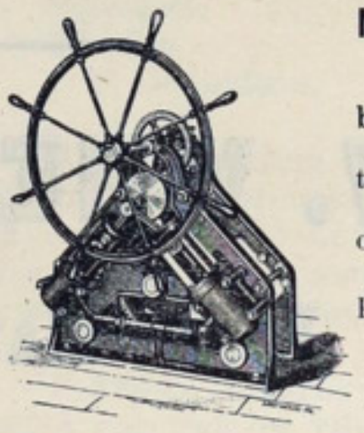

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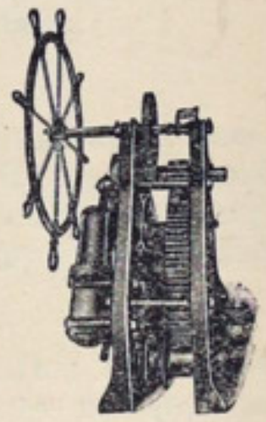

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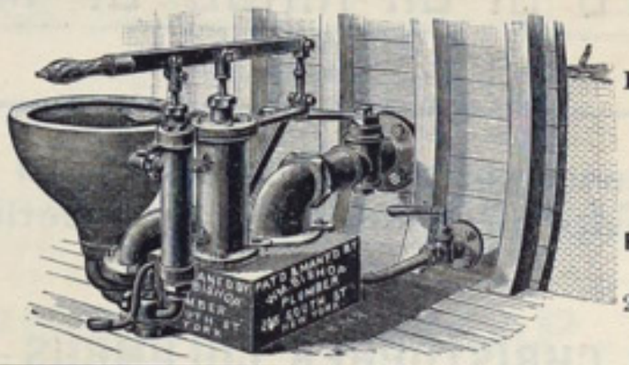

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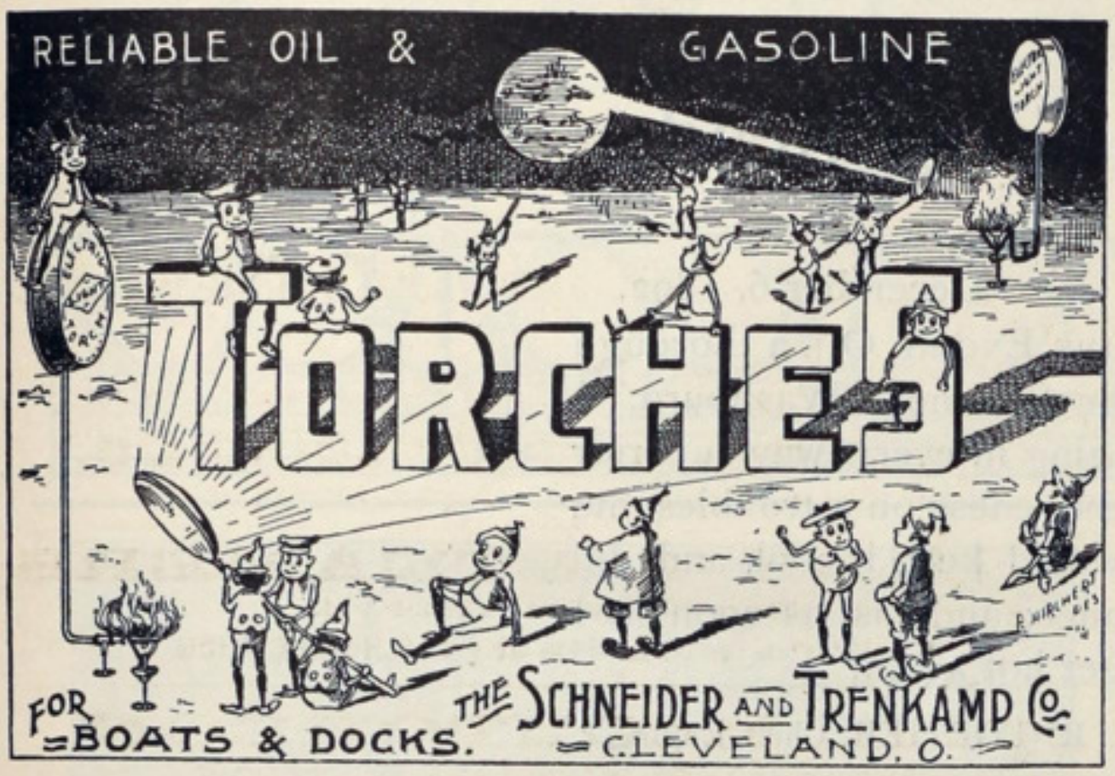

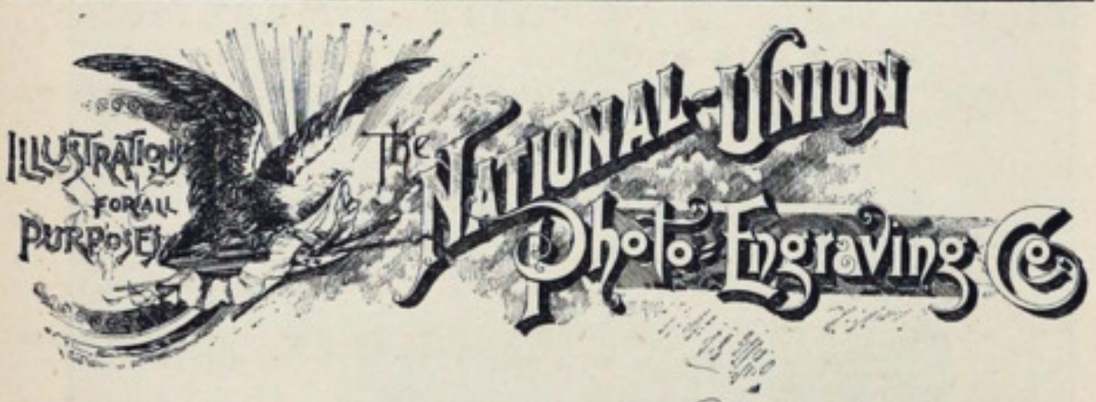
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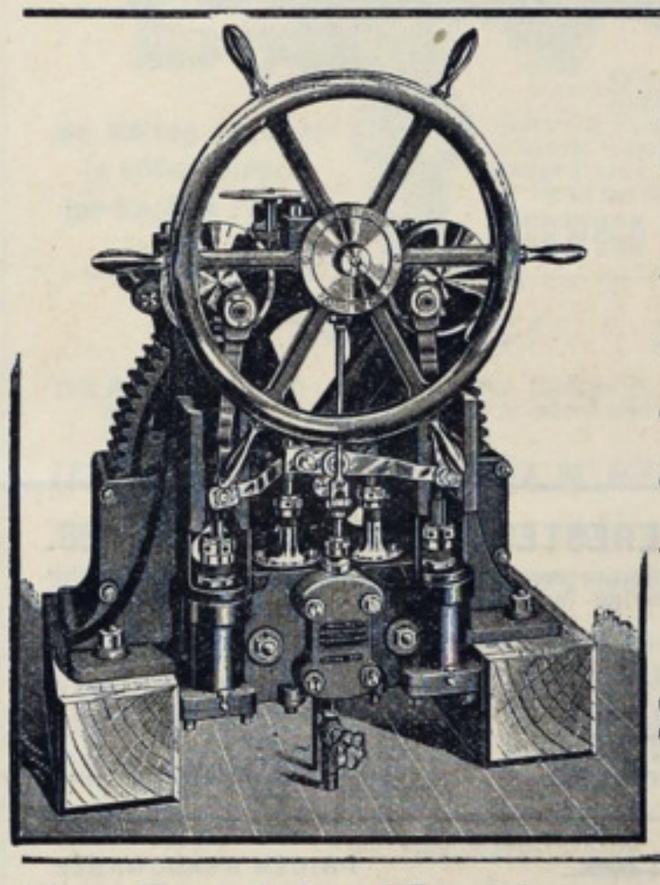

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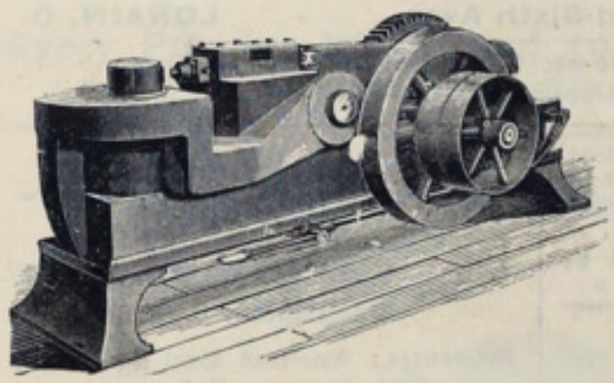

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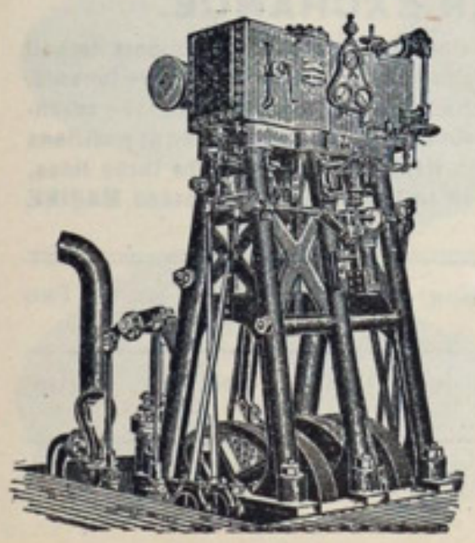

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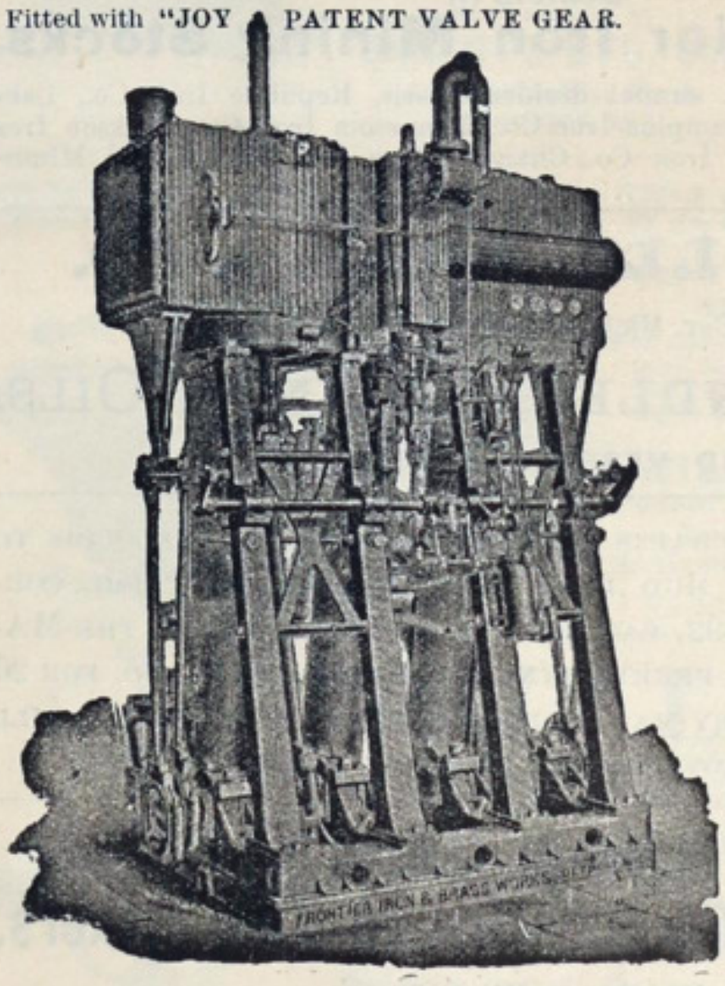

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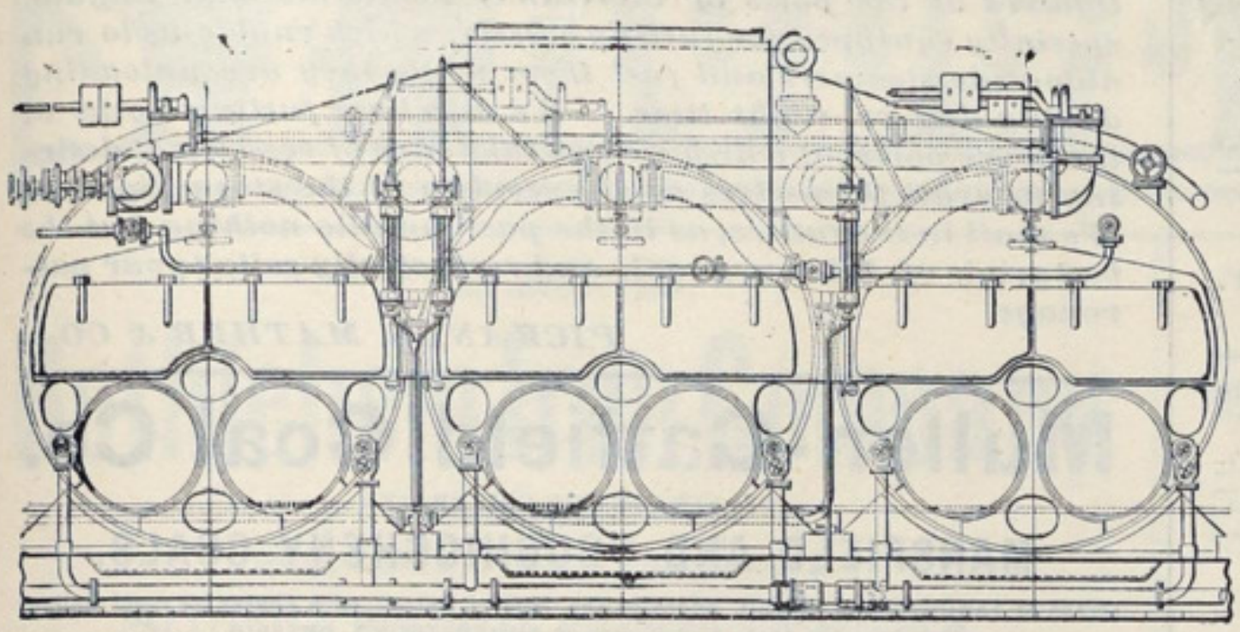

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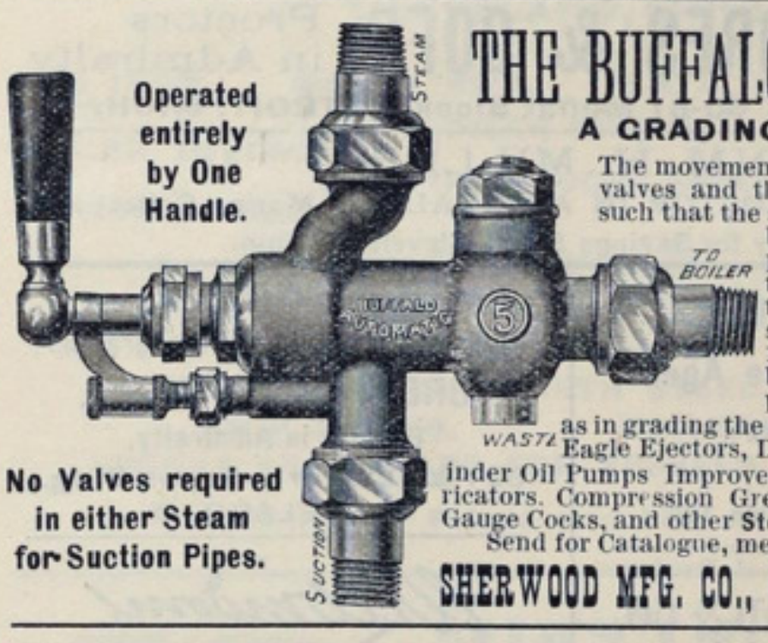

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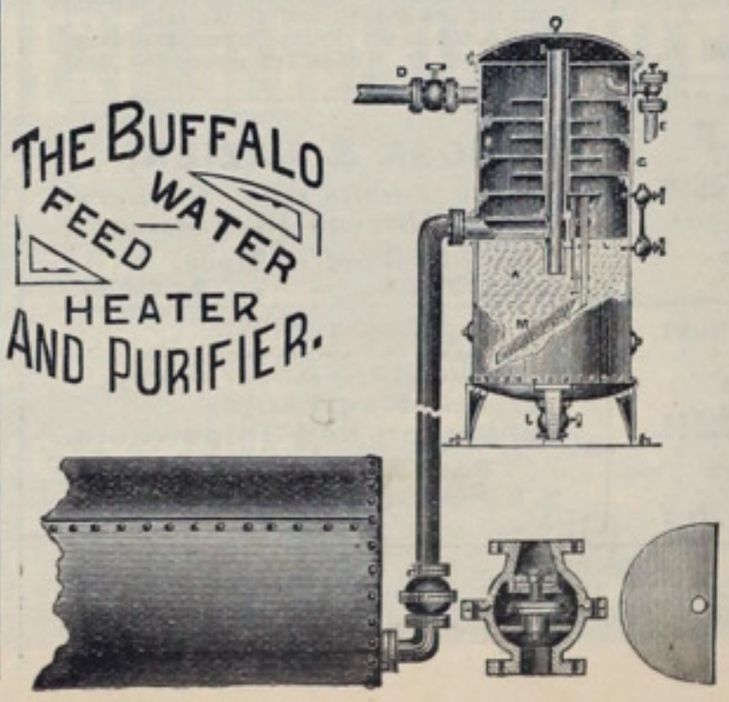

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C.—Feed pipe to boil
D.—Steam pipe.
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F.—Check valve.
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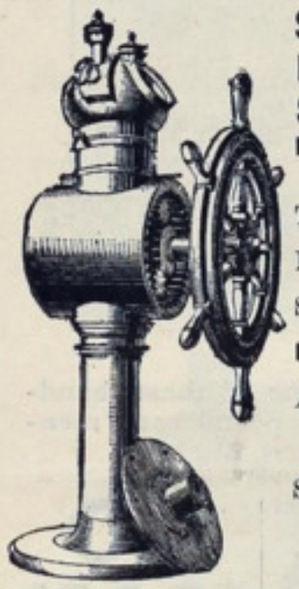

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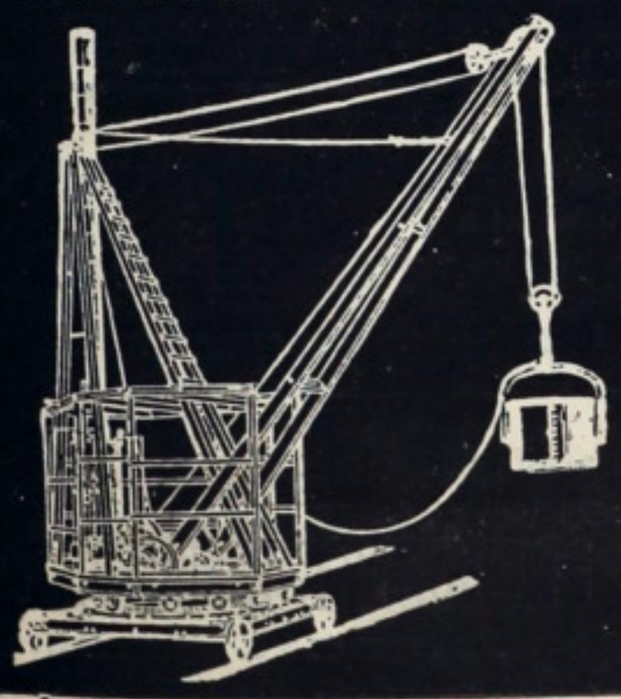

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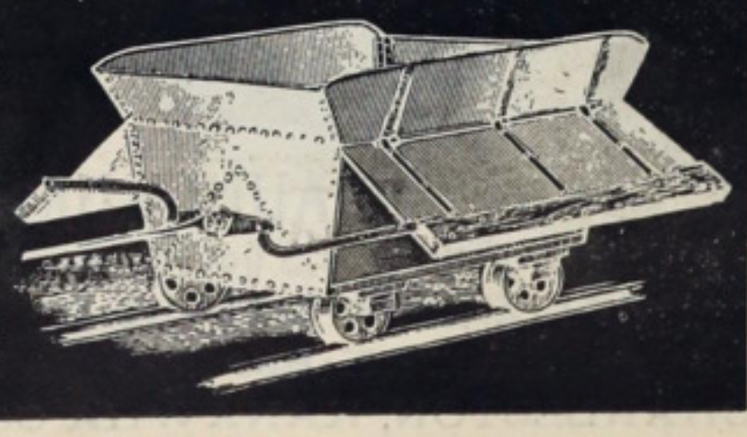

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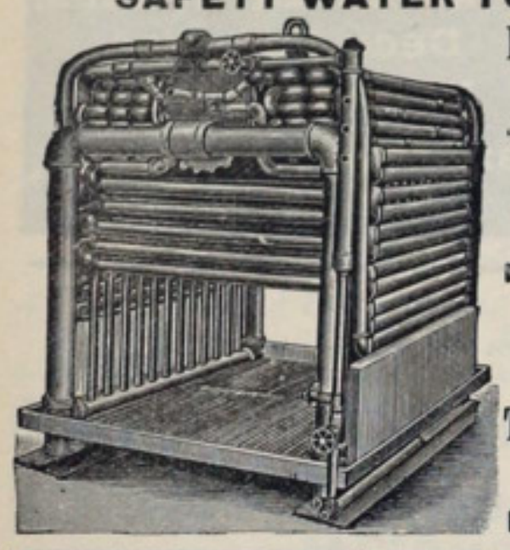

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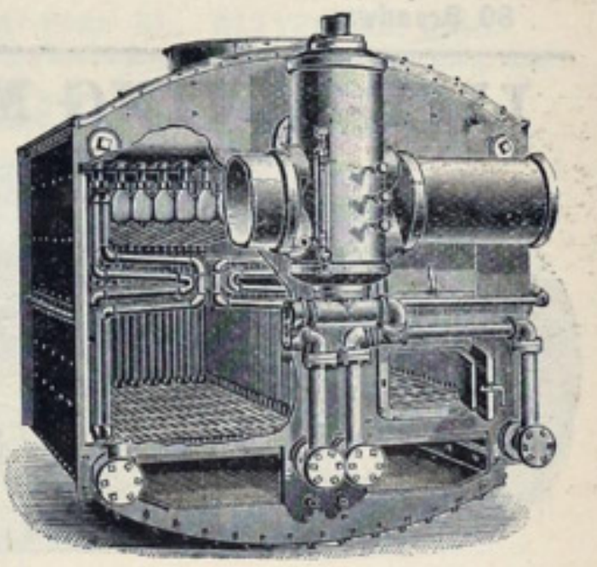

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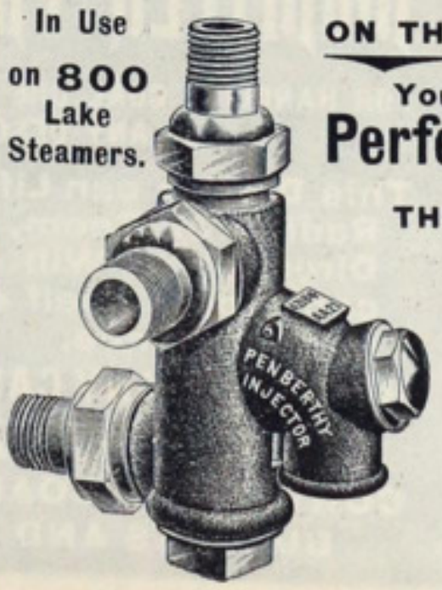

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